



#7

SEQUENCE LISTING

<110> Zonana al.

<120> Hypohydrotic ectodermal dysplasia genes and proteins

<130> 55924

<140> 09/729,658

<141> 2000-12-04

<150> 09/342,681

<151> 1999-06-29

<150> 60/092,279

<151> 1998-07-09

<150> 60/112,366

<151> 1998-12-15

<160> 122

<170> PatentIn Ver. 2.1

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 Gln Gln Pro Leu Glu Pro Gly Glu Ala Ala Leu His Ser Asp Ser Gln
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Phe Leu Gly Phe Phe Gly Leu Ser Leu Ala Leu His Leu Leu Thr Leu				
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Cys Cys Tyr Leu Glu Leu Arg Ser Glu Leu Arg Arg Glu Arg Gly Thr				
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Arg Arg Asn Lys Arg Ser Lys Ser Gly Glu Gly Ala Asp Gly Pro Val				
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gtg ttt aaa cta cat ccc cgc agc ggg gag ctg gag gtc tac tac atc 1035
 Val Phe Lys Leu His Pro Arg Ser Gly Glu Leu Glu Val Tyr Tyr Ile
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aac ttc act gac ttt gcc agc tac gag gtg gtg gtg gat gag aag ccc 1083
 Asn Phe Thr Asp Phe Ala Ser Tyr Glu Val Val Val Asp Glu Lys Pro
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<212> DNA
<213> Homo sapiens

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<212> DNA
<213> Homo sapiens

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<223> n represents a, c, t, or g

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<212> DNA

<213> Homo sapiens

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gtgaaaaaga ccctcccaca ccctgccatc tgattccctc ctgcagggcc tcaggcccct 780
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1				5				10					15				
cca	agg	gag	cgg	ggc	agc	cag	ggc	tgc	ggc	tgt	cgc	ggg	gcc	cct	gct	96	
Pro	Arg	Glu	Arg	Gly	Ser	Gln	Gly	Cys	Gly	Cys	Arg	Gly	Ala	Pro	Ala		
			20				25					30					
cgg	gcg	ggc	gaa	ggg	aac	agc	tgc	cgg	ctc	ttc	ctg	ggt	ttc	ttt	ggc	144	
Arg	Ala	Gly	Glu	Gly	Asn	Ser	Cys	Arg	Leu	Phe	Leu	Gly	Phe	Phe	Gly		
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ctc tgc ctg gcc ctc cac ctg ctg acg ctg tgc tgc tac cta gag ttg	192
Leu Ser Leu Ala Leu His Leu Leu Thr Leu Cys Cys Tyr Leu Glu Leu	
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cgg tcc gaa ttg cgg cgg gaa cgg gga acc gag tcc cgc ctc ggt ggc	240
Arg Ser Glu Leu Arg Arg Glu Arg Gly Thr Glu Ser Arg Leu Gly Gly	
65 70 75 80	
ccg ggt gct cct ggc acc tct ggc acc cta agc agc cct ggg agc ctc	288
Pro Gly Ala Pro Gly Thr Ser Gly Thr Leu Ser Ser Pro Gly Ser Leu	
85 90 95	
gac ccg gtg ggt ccc atc acc cgc cac ctg ggg cag ccg tcc ttt caa	336
Asp Pro Val Gly Pro Ile Thr Arg His Leu Gly Gln Pro Ser Phe Gln	
100 105 110	
cag cag cct ttg gaa ccg gga gaa gat cca ctc ccc cct gag tcc cag	384
Gln Gln Pro Leu Glu Pro Gly Glu Asp Pro Leu Pro Pro Glu Ser Gln	
115 120 125	
gac ccg cac cag atg gcc ctc ctg aat ttc ttc ttt cct gat gaa aag	432
Asp Arg His Gln Met Ala Leu Leu Asn Phe Phe Phe Pro Asp Glu Lys	
130 135 140	
gca tat tct gaa gag gaa agt agg cgt gtt cgc cgc aat aag aga agc	480
Ala Tyr Ser Glu Glu Glu Ser Arg Arg Val Arg Arg Asn Lys Arg Ser	
145 150 155 160	
aaa agt ggt gaa gga gca gat ggt cct gtt aaa aac aag aaa aag gga	528
Lys Ser Gly Glu Gly Ala Asp Gly Pro Val Lys Asn Lys Lys Lys Gly	
165 170 175	
aag aag gca ggg cca cct ggg ccc aac ggc ccc cca gga cct cca gga	576
Lys Lys Ala Gly Pro Pro Gly Pro Asn Gly Pro Pro Gly Pro Pro Gly	
180 185 190	
cct ccg gga ccc cag gga cct cca ggg att cca gga att cct ggg att	624
Pro Pro Gly Pro Gln Gly Pro Pro Gly Ile Pro Gly Ile Pro Gly Ile	
195 200 205	
cca gga aca act gtt atg gga cca cct ggc cca cct ggc cct cct ggt	672
Pro Gly Thr Thr Val Met Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly	
210 215 220	
cct caa gga ccc cct ggc ctc caa gga cct tct ggt gct gct gat aaa	720
Pro Gln Gly Pro Pro Gly Leu Gln Gly Pro Ser Gly Ala Ala Asp Lys	
225 230 235 240	
act gga act cgg gaa aat cag cca gct gtg gtg cat ctg cag ggc caa	768
Thr Gly Thr Arg Glu Asn Gln Pro Ala Val Val His Leu Gln Gly Gln	
245 250 255	
ggg tca gca att caa gtc aaa aat gat ctt tca ggt gga gtg ctc aat	816
Gly Ser Ala Ile Gln Val Lys Asn Asp Leu Ser Gly Gly Val Leu Asn	
260 265 270	

gac tgg tct cgc atc act atg aac cct aag gtg ttt aaa cta cat ccc	864
Asp Trp Ser Arg Ile Thr Met Asn Pro Lys Val Phe Lys Leu His Pro	
275 280 285	
cgc agc ggg gag ctg gag gtc tac tac atc aac ttc act gac ttt gcc	912
Arg Ser Gly Glu Leu Glu Val Tyr Tyr Ile Asn Phe Thr Asp Phe Ala	
290 295 300	
agc tac gag gtg gtg gtg gat gag aag ccc ttc ctg cag tgc acc cgc	960
Ser Tyr Glu Val Val Val Asp Glu Lys Pro Phe Leu Gln Cys Thr Arg	
305 310 315 320	
agc att gag aca ggg aag acc aac tac aac act tgc tat act gca gcc	1008
Ser Ile Glu Thr Gly Lys Thr Asn Tyr Asn Thr Cys Tyr Thr Ala Gly	
325 330 335	
gtg tgc ctc ctc aag gcc agg cag aaa atc gcc gtg aag atg gtg cac	1056
Val Cys Leu Leu Lys Ala Arg Gln Lys Ile Ala Val Lys Met Val His	
340 345 350	
gct gac atc tct atc aat atg agc aag cac acc acc ttc ttc ggg gcc	1104
Ala Asp Ile Ser Ile Asn Met Ser Lys His Thr Thr Phe Phe Gly Ala	
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gtg gtg tct ctg atg tgc tca gcc cga gcg gaa tac tca aac tgc ggt	96
Val Val Ser Leu Met Cys Ser Ala Arg Ala Glu Tyr Ser Asn Cys Gly	
20 25 30	
gag aac gag tac tac aac cag act acg ggg ctg tgc cag gag tgc ccc	144
Glu Asn Glu Tyr Tyr Asn Gln Thr Thr Gly Leu Cys Gln Glu Cys Pro	
35 40 45	
ccg tgt ggg ccg gga gag gag ccc tac ctg tcc tgt ggc tac ggc acc	192
Pro Cys Gly Pro Gly Glu Glu Pro Tyr Leu Ser Cys Gly Tyr Gly Thr	
50 55 60	
aaa gac gag gac tac ggc tgc gtc ccc tgc ccg gcg gag aag ttt tcc	240
Lys Asp Glu Asp Tyr Gly Cys Val Pro Cys Pro Ala Glu Lys Phe Ser	

65	70	75	80	
aaa gga ggc tac cag ata tgc agg cgt cac	aaa gac tgt gag ggc ttc	288		
Lys Gly Gly Tyr Gln Ile Cys Arg Arg His	Lys Asp Cys Glu Gly Phe			
85	90	95		
ttc cgg gcc acc gtg ctg aca cca ggg gac atg gag aat gac gct gag	336			
Phe Arg Ala Thr Val Leu Thr Pro Gly Asp Met Glu Asn Asp Ala Glu				
100	105	110		
tgt ggc cct tgc ctc cct ggc tac tac atg ctg gag aac aga ccg agg	384			
Cys Gly Pro Cys Leu Pro Gly Tyr Tyr Met Leu Glu Asn Arg Pro Arg				
115	120	125		
aac atc tat ggc atg gtc tgc tac tcc tgc ctc ctg gca ccc ccc aac	432			
Asn Ile Tyr Gly Met Val Cys Tyr Ser Cys Leu Leu Ala Pro Pro Asn				
130	135	140		
acc aag gaa tgt gtg gga gcc act tca gga gct tct gcc aac ttc cct	480			
Thr Lys Glu Cys Val Gly Ala Thr Ser Gly Ala Ser Ala Asn Phe Pro				
145	150	155	160	
ggc acc tcg ggc agc agc acc ctg tct ccc ttc cag cac gcc cac aaa	528			
Gly Thr Ser Gly Ser Ser Thr Leu Ser Pro Phe Gln His Ala His Lys				
165	170	175		
gaa ctc tca ggc caa gga cac ctg gcc act gcc ctg atc att gca atg	576			
Glu Leu Ser Gly Gln Gly His Leu Ala Thr Ala Leu Ile Ile Ala Met				
180	185	190		
tcc acc atc ttc atc atg gcc atc gcc atc gtc ctc atc atc atg ttc	624			
Ser Thr Ile Phe Ile Met Ala Ile Ala Ile Val Leu Ile Ile Met Phe				
195	200	205		
tac atc ctg aag aca aag ccc tct gcc cca gcc tgt tgc acc agc cac	672			
Tyr Ile Leu Lys Thr Lys Pro Ser Ala Pro Ala Cys Cys Thr Ser His				
210	215	220		
ccg ggg aag agc gtg gag gcc caa gtg agc aag gac gag gag aag aaa	720			
Pro Gly Lys Ser Val Glu Ala Gln Val Ser Lys Asp Glu Glu Lys Lys				
225	230	235	240	
gag gcc cca gac aac gtg gtg atg ttc tcc gag aag gat gaa ttt gag	768			
Glu Ala Pro Asp Asn Val Val Met Phe Ser Glu Lys Asp Glu Phe Glu				
245	250	255		
aag ctg aca gca act cca gca aag ccc acc aag agc gag aac gat gcc	816			
Lys Leu Thr Ala Thr Pro Ala Lys Pro Thr Lys Ser Glu Asn Asp Ala				
260	265	270		
tca tcc gag aat gag cag ctg ctg agc cgg agc gtc gac agt gat gag	864			
Ser Ser Glu Asn Glu Gln Leu Leu Ser Arg Ser Val Asp Ser Asp Glu				
275	280	285		
gag ccc gcc cct gac aag cag ggc tcc ccg gag ctg tgc ctg ctg tcg	912			
Glu Pro Ala Pro Asp Lys Gln Gly Ser Pro Glu Leu Cys Leu Leu Ser				
290	295	300		

ctg gtt cac ctg gcc agg gag aag tct gcc acc agc aac aag tca gcc	960
Leu Val His Leu Ala Arg Glu Lys Ser Ala Thr Ser Asn Lys Ser Ala	
305 310 315 320	
ggg att caa agc cgg agg aaa aag atc ctc gat gtg tat gcc aac gtg	1008
Gly Ile Gln Ser Arg Arg Lys Lys Ile Leu Asp Val Tyr Ala Asn Val	
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Cys Gly Val Val Glu Gly Leu Ser Pro Thr Glu Leu Pro Phe Asp Cys	
340 345 350	
ctc gag aag act agc cga atg ctc agc tcc acg tac aac tct gag aag	1104
Leu Glu Lys Thr Ser Arg Met Leu Ser Ser Thr Tyr Asn Ser Glu Lys	
355 360 365	
gct gtt gtg aaa acg tgg cgc cac ctc gcc gag agc ttc ggc ctg aag	1152
Ala Val Val Lys Thr Trp Arg His Leu Ala Glu Ser Phe Gly Leu Lys	
370 375 380	
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Arg Asp Glu Ile Gly Gly Met Thr Asp Gly Met Gln Leu Phe Asp Arg	
385 390 395 400	
atc agc acg gca ggc tac agc atc cct gag cta ctc aca aaa ctg gtg	1248
Ile Ser Thr Ala Gly Tyr Ser Ile Pro Glu Leu Leu Thr Lys Leu Val	
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cag att gag cgg ctg gat gct gtg gag tcc ttg tgt gca gac ata ctg	1296
Gln Ile Glu Arg Leu Asp Ala Val Glu Ser Leu Cys Ala Asp Ile Leu	
420 425 430	
gag tgg gcg ggg gtt gtg cca cct gcc tcc cag cca cat gct gca tcc	1344
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tga	1347

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35 40 45	
Pro Cys Gly Pro Gly Glu Glu Pro Tyr Leu Ser Cys Gly Tyr Gly Thr	
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Lys Asp Glu Asp Tyr Gly Cys Val Pro Cys Pro Ala Glu Lys Phe Ser	
65 70 75 80	

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Phe	Arg	Ala	Thr	Val	Leu	Thr	Pro	Gly	Asp	Met	Glu	Asn	Asp	Ala	Glu
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Cys	Gly	Pro	Cys	Leu	Pro	Gly	Tyr	Met	Leu	Glu	Asn	Arg	Pro	Arg	
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Asn	Ile	Tyr	Gly	Met	Val	Cys	Tyr	Ser	Cys	Leu	Leu	Ala	Pro	Pro	Asn
	130					135					140				
Thr	Lys	Glu	Cys	Val	Gly	Ala	Thr	Ser	Gly	Ala	Ser	Ala	Asn	Phe	Pro
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Gly	Thr	Ser	Gly	Ser	Ser	Thr	Leu	Ser	Pro	Phe	Gln	His	Ala	His	Lys
				165					170					175	
Glu	Leu	Ser	Gly	Gln	Gly	His	Leu	Ala	Thr	Ala	Leu	Ile	Ile	Ala	Met
			180					185					190		
Ser	Thr	Ile	Phe	Ile	Met	Ala	Ile	Ala	Ile	Val	Leu	Ile	Ile	Met	Phe
		195				200						205			
Tyr	Ile	Leu	Lys	Thr	Lys	Pro	Ser	Ala	Pro	Ala	Cys	Cys	Thr	Ser	His
	210					215					220				
Pro	Gly	Lys	Ser	Val	Glu	Ala	Gln	Val	Ser	Lys	Asp	Glu	Glu	Lys	Lys
225					230					235					240
Glu	Ala	Pro	Asp	Asn	Val	Val	Met	Phe	Ser	Glu	Lys	Asp	Glu	Phe	Glu
				245				250						255	
Lys	Leu	Thr	Ala	Thr	Pro	Ala	Lys	Pro	Thr	Lys	Ser	Glu	Asn	Asp	Ala
			260					265					270		
Ser	Ser	Glu	Asn	Glu	Gln	Leu	Leu	Ser	Arg	Ser	Val	Asp	Ser	Asp	Glu
		275				280					285				
Glu	Pro	Ala	Pro	Asp	Lys	Gln	Gly	Ser	Pro	Glu	Leu	Cys	Leu	Leu	Ser
	290					295					300				
Leu	Val	His	Leu	Ala	Arg	Glu	Lys	Ser	Ala	Thr	Ser	Asn	Lys	Ser	Ala
305					310					315					320
Gly	Ile	Gln	Ser	Arg	Arg	Lys	Lys	Ile	Leu	Asp	Val	Tyr	Ala	Asn	Val
				325					330					335	
Cys	Gly	Val	Val	Glu	Gly	Leu	Ser	Pro	Thr	Glu	Leu	Pro	Phe	Asp	Cys
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Leu	Glu	Lys	Thr	Ser	Arg	Met	Leu	Ser	Ser	Thr	Tyr	Asn	Ser	Glu	Lys
		355				360						365			
Ala	Val	Val	Lys	Thr	Trp	Arg	His	Leu	Ala	Glu	Ser	Phe	Gly	Leu	Lys
	370					375					380				
Arg	Asp	Glu	Ile	Gly	Gly	Met	Thr	Asp	Gly	Met	Gln	Leu	Phe	Asp	Arg
385					390					395					400
Ile	Ser	Thr	Ala	Gly	Tyr	Ser	Ile	Pro	Glu	Leu	Leu	Thr	Lys	Leu	Val
				405					410					415	
Gln	Ile	Glu	Arg	Leu	Asp	Ala	Val	Glu	Ser	Leu	Cys	Ala	Asp	Ile	Leu
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Glu	Trp	Ala	Gly	Val	Val	Pro	Pro	Ala	Ser	Gln	Pro	His	Ala	Ala	Ser
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 gtgtgccagg tcccaggcag ccctgctgac ccctaaggac atagagtacc tgcttctgag 300
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 ccttgggaga gg atg gcc cat gtg ggg gac tgc acg cag acg ccc tgg ctc 471
 Met Ala His Val Gly Asp Cys Thr Gln Thr Pro Trp Leu
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 ccc gtc ctg gtg gtg tct ctg atg tgc tca gcc cga gcg gaa tac tca 519
 Pro Val Leu Val Val Ser Leu Met Cys Ser Ala Arg Ala Glu Tyr Ser
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 aac tgc ggt gag aac gag tac tac aac cag act acg ggg ctg tgc cag 567
 Asn Cys Gly Glu Asn Glu Tyr Tyr Asn Gln Thr Thr Gly Leu Cys Gln
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 gag tgc ccc ccg tgt ggg ccg gga gag gag ccc tac ctg tcc tgt ggc 615
 Glu Cys Pro Pro Cys Gly Pro Gly Glu Glu Pro Tyr Leu Ser Cys Gly
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 tac ggc acc aaa gac gag gac tac ggc tgc gtc ccc tgc ccg gcg gag 663
 Tyr Gly Thr Lys Asp Glu Asp Tyr Gly Cys Val Pro Cys Pro Ala Glu
 65 70 75
 aag ttt tcc aaa gga ggc tac cag ata tgc agg cgt cac aaa gac tgt 711
 Lys Phe Ser Lys Gly Gly Tyr Gln Ile Cys Arg Arg His Lys Asp Cys
 80 85 90
 gag ggc ttc ttc ccg gcc acc gtg ctg aca cca ggg gac atg gag aat 759
 Glu Gly Phe Phe Arg Ala Thr Val Leu Thr Pro Gly Asp Met Glu Asn
 95 100 105
 gac gct gag tgt ggc cct tgc ctc cct ggc tac tac atg ctg gag aac 807
 Asp Ala Glu Cys Gly Pro Cys Leu Pro Gly Tyr Tyr Met Leu Glu Asn
 110 115 120 125
 aga ccg agg aac atc tat ggc atg gtc tgc tac tcc tgc ctc ctg gca 855
 Arg Pro Arg Asn Ile Tyr Gly Met Val Cys Tyr Ser Cys Leu Leu Ala
 130 135 140
 ccc ccc aac acc aag gaa tgt gtg gga gcc act tca gga gct tct gcc 903
 Pro Pro Asn Thr Lys Glu Cys Val Gly Ala Thr Ser Gly Ala Ser Ala
 145 150 155
 aac ttc cct ggc acc tcg ggc agc agc acc ctg tct ccc ttc cag cac 951

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Ala	His	Lys	Glu	Leu	Ser	Gly	Gln	Gly	His	Leu	Ala	Thr	Ala	Leu	Ile	
		175				180				185						
att	gca	atg	tcc	acc	atc	ttc	atc	atg	gcc	atc	gcc	atc	gtc	ctc	atc	1047
Ile	Ala	Met	Ser	Thr	Ile	Phe	Ile	Met	Ala	Ile	Ala	Ile	Val	Leu	Ile	
		190			195				200					205		
atc	atg	ttc	tac	atc	ctg	aag	aca	aag	ccc	tct	gcc	cca	gcc	tgt	tgc	1095
Ile	Met	Phe	Tyr	Ile	Leu	Lys	Thr	Lys	Pro	Ser	Ala	Pro	Ala	Cys	Cys	
			210					215						220		
acc	agc	cac	ccg	ggg	aag	agc	gtg	gag	gcc	caa	gtg	agc	aag	gac	gag	1143
Thr	Ser	His	Pro	Gly	Lys	Ser	Val	Glu	Ala	Gln	Val	Ser	Lys	Asp	Glu	
			225					230					235			
gag	aag	aaa	gag	gcc	cca	gac	aac	gtg	gtg	atg	ttc	tcc	gag	aag	gat	1191
Glu	Lys	Lys	Glu	Ala	Pro	Asp	Asn	Val	Val	Met	Phe	Ser	Glu	Lys	Asp	
		240					245					250				
gaa	ttt	gag	aag	ctg	aca	gca	act	cca	gca	aag	ccc	acc	aag	agc	gag	1239
Glu	Phe	Glu	Lys	Leu	Thr	Ala	Thr	Pro	Ala	Lys	Pro	Thr	Lys	Ser	Glu	
		255				260					265					
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Asn	Asp	Ala	Ser	Ser	Glu	Asn	Glu	Gln	Leu	Leu	Ser	Arg	Ser	Val	Asp	
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agt	gat	gag	gag	ccc	gcc	cct	gac	aag	cag	ggc	tcc	ccg	gag	ctg	tgc	1335
Ser	Asp	Glu	Glu	Pro	Ala	Pro	Asp	Lys	Gln	Gly	Ser	Pro	Glu	Leu	Cys	
				290					295					300		
ctg	ctg	tcg	ctg	gtt	cac	ctg	gcc	agg	gag	aag	tct	gcc	acc	agc	aac	1383
Leu	Leu	Ser	Leu	Val	His	Leu	Ala	Arg	Glu	Lys	Ser	Ala	Thr	Ser	Asn	
			305					310					315			
aag	tca	gcc	ggg	att	caa	agc	cgg	agg	aaa	aag	atc	ctc	gat	gtg	tat	1431
Lys	Ser	Ala	Gly	Ile	Gln	Ser	Arg	Arg	Lys	Lys	Ile	Leu	Asp	Val	Tyr	
		320					325					330				
gcc	aac	gtg	tgt	gga	gtc	gtg	gaa	ggt	ctt	agc	ccc	acg	gag	ctg	cca	1479
Ala	Asn	Val	Cys	Gly	Val	Val	Glu	Gly	Leu	Ser	Pro	Thr	Glu	Leu	Pro	
		335				340					345					
ttt	gat	tgc	ctc	gag	aag	act	agc	cga	atg	ctc	agc	tcc	acg	tac	aac	1527
Phe	Asp	Cys	Leu	Glu	Lys	Thr	Ser	Arg	Met	Leu	Ser	Ser	Thr	Tyr	Asn	
		350			355				360						365	
tct	gag	aag	gct	gtt	gtg	aaa	acg	tgg	cgc	cac	ctc	gcc	gag	agc	ttc	1575
Ser	Glu	Lys	Ala	Val	Val	Lys	Thr	Trp	Arg	His	Leu	Ala	Glu	Ser	Phe	
			370					375						380		
ggc	ctg	aag	agg	gat	gag	att	ggg	ggc	atg	aca	gac	ggc	atg	caa	ctc	1623
Gly	Leu	Lys	Arg	Asp	Glu	Ile	Gly	Gly	Met	Thr	Asp	Gly	Met	Gln	Leu	

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Phe Asp Arg Ile Ser Thr Ala Gly Tyr Ser Ile Pro Glu Leu Leu Thr			
400	405	410	
aaa ctg gtg cag att gag cgg ctg gat gct gtg gag tcc ttg tgt gca			1719
Lys Leu Val Gln Ile Glu Arg Leu Asp Ala Val Glu Ser Leu Cys Ala			
415	420	425	
gac ata ctg gag tgg gcg ggg gtt gtg cca cct gcc tcc cag cca cat			1767
Asp Ile Leu Glu Trp Ala Gly Val Val Pro Pro Ala Ser Gln Pro His			
430	435	440	445
gct gca tcc tga aaagcatgcc tgtgggctgt cctcccagga caagccaagg			1819
Ala Ala Ser			
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tcaccaggca gagtaaatat ctactcactc atacagccag cccaccagcc caccattaac			2059
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ctctctgcct cagtttctcg tctgccaatg agatgttagt tagtgattct ataattgggg			3019

caggtagggg tcaggtgagc aaaaagaaag tggagctata ggaaatgcca ggcctttgag 3079
 gtgctctatg gaagtcaaca cagtgtgggt tgtccattta aatgggaata aaaacagaaa 3139
 aactcagact tggcattttc acaataactg caatggtttg acataacatt tataggcaga 3199
 aagttaataa actggcattg ttcttggcat attattgtac tatccctgta actgccaaga 3259
 gctcaggagc caggctagtg atcacaccag ggggttagagt tcaactgctga actccctgat 3319
 ggcaggctctg tgtttattac tacattaataa caaagtctct gacttataaa gcgagggtcgt 3379
 aaaaattaca agttgcatga ctgaaaaaat gctttagggg gaaaatcagt catatcttta 3439
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 cttaattaga ctgcaaatgt cacttgatgag gagtggcca ttccaggata acagcttgca 3739
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 tccattggct ctccacctgc catttttagg gagctattcc ttatatagtt acaaattccc 3919
 ttgtcattta cttatttggg aacatgggat ttactctgac aagctttagc ctatgttatg 3979
 ggattcagaa caatgagatc ataataattc tcaactgacca aagctgggac tccatcctgc 4039
 catttttgtg tggagatatt cataattctg caatacttta aaacatttag aaaacacccc 4099
 agggtaggtc tgtggccctt agacagtga gtcttaattg tcaatattat ttttgtctaa 4159
 ttctgtatat atataactta ttatatttta taatctcaat aaacacatta ataaaaaaaa 4219
 aaaaaaaaaa aaaaaa 4235

<210> 19
 <211> 448
 <212> PRT
 <213> Homo sapiens

<400> 19
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 Val Val Ser Leu Met Cys Ser Ala Arg Ala Glu Tyr Ser Asn Cys Gly
 20 25 30
 Glu Asn Glu Tyr Tyr Asn Gln Thr Thr Gly Leu Cys Gln Glu Cys Pro
 35 40 45
 Pro Cys Gly Pro Gly Glu Glu Pro Tyr Leu Ser Cys Gly Tyr Gly Thr
 50 55 60

Lys	Asp	Glu	Asp	Tyr	Gly	Cys	Val	Pro	Cys	Pro	Ala	Glu	Lys	Phe	Ser	65	70	75	80
Lys	Gly	Gly	Tyr	Gln	Ile	Cys	Arg	Arg	His	Lys	Asp	Cys	Glu	Gly	Phe		85	90	95
Phe	Arg	Ala	Thr	Val	Leu	Thr	Pro	Gly	Asp	Met	Glu	Asn	Asp	Ala	Glu	100	105	110	
Cys	Gly	Pro	Cys	Leu	Pro	Gly	Tyr	Tyr	Met	Leu	Glu	Asn	Arg	Pro	Arg	115	120	125	
Asn	Ile	Tyr	Gly	Met	Val	Cys	Tyr	Ser	Cys	Leu	Leu	Ala	Pro	Pro	Asn	130	135	140	
Thr	Lys	Glu	Cys	Val	Gly	Ala	Thr	Ser	Gly	Ala	Ser	Ala	Asn	Phe	Pro	145	150	155	160
Gly	Thr	Ser	Gly	Ser	Ser	Thr	Leu	Ser	Pro	Phe	Gln	His	Ala	His	Lys	165	170	175	
Glu	Leu	Ser	Gly	Gln	Gly	His	Leu	Ala	Thr	Ala	Leu	Ile	Ile	Ala	Met	180	185	190	
Ser	Thr	Ile	Phe	Ile	Met	Ala	Ile	Ala	Ile	Val	Leu	Ile	Ile	Met	Phe	195	200	205	
Tyr	Ile	Leu	Lys	Thr	Lys	Pro	Ser	Ala	Pro	Ala	Cys	Cys	Thr	Ser	His	210	215	220	
Pro	Gly	Lys	Ser	Val	Glu	Ala	Gln	Val	Ser	Lys	Asp	Glu	Glu	Lys	Lys	225	230	235	240
Glu	Ala	Pro	Asp	Asn	Val	Val	Met	Phe	Ser	Glu	Lys	Asp	Glu	Phe	Glu	245	250	255	
Lys	Leu	Thr	Ala	Thr	Pro	Ala	Lys	Pro	Thr	Lys	Ser	Glu	Asn	Asp	Ala	260	265	270	
Ser	Ser	Glu	Asn	Glu	Gln	Leu	Leu	Ser	Arg	Ser	Val	Asp	Ser	Asp	Glu	275	280	285	
Glu	Pro	Ala	Pro	Asp	Lys	Gln	Gly	Ser	Pro	Glu	Leu	Cys	Leu	Leu	Ser	290	295	300	
Leu	Val	His	Leu	Ala	Arg	Glu	Lys	Ser	Ala	Thr	Ser	Asn	Lys	Ser	Ala	305	310	315	320
Gly	Ile	Gln	Ser	Arg	Arg	Lys	Lys	Ile	Leu	Asp	Val	Tyr	Ala	Asn	Val	325	330	335	
Cys	Gly	Val	Val	Glu	Gly	Leu	Ser	Pro	Thr	Glu	Leu	Pro	Phe	Asp	Cys	340	345	350	
Leu	Glu	Lys	Thr	Ser	Arg	Met	Leu	Ser	Ser	Thr	Tyr	Asn	Ser	Glu	Lys	355	360	365	
Ala	Val	Val	Lys	Thr	Trp	Arg	His	Leu	Ala	Glu	Ser	Phe	Gly	Leu	Lys	370	375	380	
Arg	Asp	Glu	Ile	Gly	Gly	Met	Thr	Asp	Gly	Met	Gln	Leu	Phe	Asp	Arg	385	390	395	400
Ile	Ser	Thr	Ala	Gly	Tyr	Ser	Ile	Pro	Glu	Leu	Leu	Thr	Lys	Leu	Val	405	410	415	
Gln	Ile	Glu	Arg	Leu	Asp	Ala	Val	Glu	Ser	Leu	Cys	Ala	Asp	Ile	Leu	420	425	430	
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<210> 20

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
Oligonucleotide primers used to amplify exon 5 of
EDA1-II.

<400> 20
agaaagcagg acctcctgg 19

<210> 21
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to amplify exon 5 of
EDA1-II.

<400> 21
ctctcaggat caccactc 19

<210> 22
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
diagnose ED.

<400> 22
tatgttggt atgactgact gagtgg 26

<210> 23
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
diagnose ED.

<400> 23
ccctaccaag aaggtagttc 20

<210> 24
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:

Oligonucleotide primers that can be used to
diagnose ED.

<400> 24
ctctcaggat caccactcc tg 22

<210> 25
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
diagnose ED.

<400> 25
tgtcaattca ccacaggag 20

<210> 26
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
diagnos ED.

<400> 26
gaatctagga tgcaggggc 19

<210> 27
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
diagnose ED.

<400> 27
tattgcggcg aacacg 16

<210> 28
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to

diagnose ED.

<400> 28
tattgcagcg aacacg 16

<210> 29
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
diagnose ED.

<400> 29
tattgcggca aaacacg 17

<210> 30
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to screen a BAC
library.

<400> 30
atcatggctg tgcactctag 20

<210> 31
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to screen a BAC
library.

<400> 31
acctactgca tgtctgtgga 20

<210> 32
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to screen a BAC
library.

<400> 32
cacatgctca gtgttgcca 20

<210> 33
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to screen a BAC
library.

<400> 33
acacaggctc agtcatgcgg 20

<210> 34
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl
gene.

<400> 34
gcggtgaccc gggagatctg aattc 25

<210> 35
<211> 11
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl
gene.

<400> 35
gaattcagat c 11

<210> 36
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl
gene.

<400> 36
 ctgagcggaa ttcgtgagac c 21

<210> 37
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers used to clone a murine dl
 gene.

<400> 37
 ggtctcacga attccgctca gtt 23

<210> 38
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers used to clone a murine dl
 gene.

<400> 38
 agtgagaatg atgcctcc 18

<210> 39
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers used to clone a murine dl
 gene.

<400> 39
 gcctttgttc agtcatagg 19

<210> 40
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers used to clone a murine dl
 gene.

<400> 40

cctgagagct ctttgtgag

19

<210> 41

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:

Oligonucleotide primers used to clone a murine dl
gene.

<400> 41

cgggatcctc gagggggggg ggggggggh

29

<210> 42

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:

Oligonucleotide primers used to clone a murine dl
gene.

<400> 42

aagcagagct ccacaatc

18

<210> 43

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:

Oligonucleotide primers used to clone a murine dl
gene.

<220>

<221> misc_feature

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<223> n represents a, c, t, or g; v represents a, g, or
c

<400> 43

ggccgctctg gacaggatat gttttttttt tttttttvn

39

<210> 44

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl
gene.

<400> 44
ggaacagtca agagcgagtt 20

<210> 45
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl
gene.

<400> 45
gcggatccag gccgctctgg acaggatatg 30

<210> 46
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 46
tggtgtctct gatgtgc 17

<210> 47
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 47
acagtggccc ggaagaag 18

<210> 48
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:

Oligonucleotide primers that were used to clone
human DL.

<400> 48

ctgcggtgag aacgagtac

19

<210> 49

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:

Oligonucleotide primers that were used to clone
human DL.

<400> 49

ggcaaggtgg cgccatgt

18

<210> 50

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:

Oligonucleotide primers that were used to clone
human DL.

<400> 50

ggcaccaaag acgaggacta

20

<210> 51

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:

Oligonucleotide primers that were used to clone
human DL.

<400> 51

tcagcgtcat tctccatgtc

20

<210> 52

<211> 46

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:

Oligonucleotide primers that were used to clone

human DL.

<400> 52
ctagactcga gaattcgcg cgcactagt tttttttttt tttttt

46

<210> 53
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 53
tctggtagcc tcctttggaa

20

<210> 54
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 54
ctagactcga gaattcg

17

<210> 55
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 55
tagtcctcgt ctttggtgcc

20

<210> 56
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 56
gagaattcgc ggccgcac

18

<210> 57
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 57
agccccgtag tctggttgta

20

<210> 58
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 58
gcgtcgacag tgatgagga

19

<210> 59
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 59
cagtcttttg gcaccactca

20

<210> 60
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<p><400> 60 acgtgtgtgg agtcgtgga</p>	19
<p><210> 61 <211> 19 <212> DNA <213> Artificial Sequence</p>	
<p><220> <223> Description of Artificial Sequence: Oligonucleotide primers that were used to clone human DL.</p>	
<p><400> 61 ctcgttggat ccttggtt</p>	19
<p><210> 62 <211> 20 <212> DNA <213> Artificial Sequence</p>	
<p><220> <223> Description of Artificial Sequence: Oligonucleotide primers that were used to clone human DL.</p>	
<p><400> 62 tacatgctgg agaacagacc</p>	20
<p><210> 63 <211> 20 <212> DNA <213> Artificial Sequence</p>	
<p><220> <223> Description of Artificial Sequence: Oligonucleotide primers that were used to clone human DL.</p>	
<p><400> 63 ttccaaagga ggctaccaga</p>	20
<p><210> 64 <211> 20 <212> DNA <213> Artificial Sequence</p>	
<p><220> <223> Description of Artificial Sequence: Oligonucleotide primers that were used to clone human DL.</p>	
<p><400> 64</p>	

ttggcagaag ctcctgaagt	20
<p><210> 65 <211> 20 <212> DNA <213> Artificial Sequence</p>	
<p><220> <223> Description of Artificial Sequence: Oligonucleotide primers that were used to clone human DL.</p>	
<p><400> 65 tgctcgagat gtgatgaagg</p>	20
<p><210> 66 <211> 20 <212> DNA <213> Artificial Sequence</p>	
<p><220> <223> Description of Artificial Sequence: Oligonucleotide primers that were used to clone human DL.</p>	
<p><400> 66 aagcagatgg ccacagaact</p>	20
<p><210> 67 <211> 19 <212> DNA <213> Artificial Sequence</p>	
<p><220> <223> Description of Artificial Sequence: Oligonucleotide primers that were used to clone human DL.</p>	
<p><400> 67 ggagaggatg gcccatgtg</p>	19
<p><210> 68 <211> 21 <212> DNA <213> Artificial Sequence</p>	
<p><220> <223> Description of Artificial Sequence: Oligonucleotide primers that were used to clone human DL.</p>	
<p><400> 68 cagaccatgc catagatggt c</p>	21

<210> 69
 <211> 20
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers that were used to clone
 human DL.

 <400> 69
 acttcaggag cttctgcca

20

<210> 70
 <211> 19
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers that were used to clone
 human DL.

 <400> 70
 tcgtccttgc tcacttggg

19

<210> 71
 <211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers that were used to clone
 human DL.

 <400> 71
 ggatgaattt gagaagctga c

21

<210> 72
 <211> 19
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers that were used to clone
 human DL.

 <400> 72
 ctgacttggt cgtggtggc

19

<210> 73
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 73
tccacgactc cacacacgt

19

<210> 74
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 74
aaataaaggt agccagaccc

20

<210> 75
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 75
gtaaggggct cagaccact

19

<210> 76
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 76
catgtgtttc taaggaggt a c

21

<210> 77
 <211> 20
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers that can be used for
 mutation screening of human DL.

 <400> 77
 caacaatgcc acaagcagga

20

<210> 78
 <211> 19
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers that can be used for
 mutation screening of human DL.

 <400> 78
 gtccgtatgg tttggctgc

19

<210> 79
 <211> 18
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers that can be used for
 mutation screening of human DL.

 <400> 79
 gccagggttt gccaggag

18

<210> 80
 <211> 19
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers that can be used for
 mutation screening of human DL.

 <400> 80
 gtccagctca cctgtctct

19

<210> 81

<211> 19
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers that can be used for
 mutation screening of human DL.

 <400> 81
 accggctctt tcctacacc 19

 <210> 82
 <211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers that can be used for
 mutation screening of human DL.

 <400> 82
 tggagcttct ctggatcatt t 21

 <210> 83
 <211> 20
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers that can be used for
 mutation screening of human DL.

 <400> 83
 aactccaggt gatcgatacc 20

 <210> 84
 <211> 20
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers that can be used for
 mutation screening of human DL.

 <400> 84
 ctgggtcatt catgccttct 20

 <210> 85
 <211> 19

<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 85
atggtgtgtg gaagccctg

19

<210> 86
<211> 21
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 86
catgagccaa ttctaactcc t

21

<210> 87
<211> 19
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 87
caggacccca gttagcctt

19

<210> 88
<211> 19
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 88
cccaggcact gctaatgac

19

<210> 89
<211> 20
<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 89
ccacatctca cagctcatca 20

<210> 90
<211> 21
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 90
tttctactgt tgcccctttc t 21

<210> 91
<211> 19
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 91
cccagccctt catgtcagt 19

<210> 92
<211> 20
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 92
tctattgact gtgacttgca 20

<210> 93
<211> 19
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:

Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 93

ctcgttggat ccttggctt

19

<210> 94

<211> 425

<212> DNA

<213> Homo sapiens

<400> 94

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ttttttttt tgggggcaga cggccgaaga gccagggtgtg ccaagggtcat atggcagcag 60
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gagtttgcaa ttagggaaag cccctcggca aggactgagt ttccaaactt gcagacaggg 180
cagggagcgg tcaaggaaga gttcccggga agccctttaa acggaaagga agcggggcta 240
gtgtcagaga ggtgtgacag gtcccagtc gccctgctgg cccctaagga catagagtac 300
ctgcttctga gagggctgcc acgggtggcca cctgtgaagc ctgtcaccca gaactggatg 360
gtacctgact ttcttcatag acccatcttc tgctgggact gaagctgacc tccaacagaa 420
gccag                                         425
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<210> 95

<211> 434

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)..(434)

<223> n represents a, c, t, or g

<400> 95

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gtaagccctg gtcctttcct ctggttttct aaactcttca gctgtggccg agacggaggt 60
gtcatgggct gggagagagg ctgggtgcat ttttgaaatg catgtcattt ttgggttgcg 120
tttgaagggt tcnccaaacc ctctgagcac gagaaacaca atcactancc tcgggtttta 180
ccttgggccc tccgtgtgct cctagcctcc tntcaggctc cctcccaggc atggctgcna 240
ggctgggaag gccccagagt cagcccaagt ggcattgggt cagcttcagc ttcattgtctg 300
cttttctttt aggatgtata gtttcccttc tgtttctctg aaggcacctt atatccagtg 360
gggttaaata aaggtagcca gacccccggc tggggtgcta ccgccagtgc ccagctaata 420
acgcatnnnt tcag                                         434
```

<210> 96

<211> 70

<212> DNA

<213> Homo sapiens

<400> 96

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gtgagccctt tgggagagga tggcccatgt gggggactgc acgcagacgc cctggctccc 60
cgtcctggtg                                         70
```

<210> 97
 <211> 722
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)..(722)
 <223> n is a, c, t or g

<400> 97
 gtaagtgggtc tgagcccctt acccccacag caccctcatc ctcatgatgg ttggactgtt 60
 tcttgccctc ttcagctgta aaatgggaat gctgatcata gtccctcctc cacagggttc 120
 ttctgagggt gaaatgaaac caggcctgca aagcacagaa ctctgcccc ggctgaagtt 180
 acattgattt cgttggtagc tcccttcata ggtctcatg gatataaacg ttcttgattg 240
 cttgtttgtg gtgtgataca cacagccctg tgtctatgtg atgagctcat gcttgggggc 300
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 ggtgttctga ggagccactg tattagaggc tcagtggggg acaggggcgc ctccctccatg 420
 accttggaac gtgcgttgat gaggagaact canagcaggc cttgatgggt ggatggggct 480
 tggccagcag ggggtgaaggc aggggtggtt tagtgggggc tggccgtgcc cangtggatc 540
 aaccaggagc cactggagac ttaacagcag tgagcactna caagcggcac cttcccagac 600
 cgagccccc gacagagcccc caccgcaggg caccctctc ctatgtcaac cttgggggtc 660
 tgcaggagtc acatgtgttt ctaaggagggt acggaggcca caacaccccc ctttgttggc 720
 ag 722

<210> 98
 <211> 123
 <212> DNA
 <213> Homo sapiens

<400> 98
 gtgtctctga tgtgctcagc ccgagcggaa tactcaaact gcggtgagaa cgagtactac 60
 aaccagacta cggggctgtg ccaggagtgc cccccgtgtg ggccgggaga ggagccctac 120
 ctg 123

<210> 99
 <211> 740
 <212> DNA
 <213> Homo sapiens

<400> 99
 gtaaggaccc agccctcctg gagcctgggt cgctctcagg ggaggcctcc tgcttgtggc 60
 attgttgccc tgagcctgcc ttgctgtgtg aggggatgcc agggatatat aaaccagccg 120
 gtcacgctcc ctggacgttg agattgatgg caagagctgc cgtgagccca ggaatggcac 180
 tcaccagcta agcattcata aacagatttt tcaggagttc tgaaatgttt ttaaaggatc 240
 actttccac tctaccctga ttaaattgagc gtcagatcat ctgattggaa gcaggattga 300
 aatattctcc agtactagta ctttttttcc tgagtgtctg atctccctcc gcctctgggc 360
 aagctaagcc tgagtgttct gttcagcact aagggaacc tccgggggtt cagtgtccgg 420
 ttcttgtagc aagctgagga aagtcagatg ccaagtgtc cctgcactgc ctgggcattc 480
 cagcagctcg ctgaattcat ctccggggagg ctcagaaaag gggcagcatc tggagcctga 540
 gagtggcgag gagaggggca agcccagagc atgagctggg tcttgggggg ttttcagtt 600
 aggacaactc aggaaccaa ggcccggcaa gagtagcttc tggagacagc tggcacgtca 660
 ctgcccagg actgtgggcc gagtccgtat gggttggctg ctgcactcac ctgtgtcccc 720
 tgtcctcttt ccctggacag 740

<210> 100
 <211> 182
 <212> DNA
 <213> Homo sapiens

<400> 100
 tcctgtggct acggcaccaa agacgaggac tacggctgcg tccccgccc ggcgaggagaag 60
 ttttccaaag gaggtacca gatatgcagg cgtcacaaag actgtgaggg cttcttccgg 120
 gccaccgtgc tgacaccagg ggacatggag aatgacgctg agtgtggccc ttgcctccct 180
 gg 182

<210> 101
 <211> 1169
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)..(1169)
 <223> n represents a, c, t, or g

<400> 101
 gtaagcacag gccctcctgg caaaccttgg catgctttct gcagaaaacc ccgaggggct 60
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 cctggccttg gtcccatccc acaaggagca gcatccagga cggagagtcc tggccccctcc 180
 ggtggacagg cagcccatca ggctctgcct ctgtgtctcc taagtggcca ttaaccatca 240
 taatatcttc tgaccaccaa aaggaaacaa attgcttgaa tacttacagt gcagtagccc 300
 atgtgaaaca ctttgggaaa aagaaaactn naatttnatg caaaaagcag tatttttnagt 360
 attctggnaa cactctggnn aanctactaa taanntanat ntgagaaaag aaatatnant 420
 gangagatta tgannncgaa gnnaagnnan gnanaancan annaggntnn agaaaatgag 480
 gttgnnaang antnataana tagnacannng ntgatatnca tnggaaagta aacngcntga 540
 gnannagtga tttgtgatng ccaggggtatt cntngaggga aaacangact attggancag 600
 anngtgngga aaggnacaaa cgntgtntna ncataganaa nntagagttg ntgggtgggc 660
 attnnaanna gcnggtaaag aatagcttgn aagtngncaa ggggtnccag aggcaannnt 720
 aatgcctata natcccataa gnntgcaggc tantggngan ggtgctnaca aagagcatgt 780
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 gccaccagag agaggaaaca gaaaggggct gagatcaaaa gaaaggccca cgttggcagc 960
 tcaatattgt taaaagaatg ctccatttca agacaggctg aaaccccaag gaaactgagt 1020
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 actggccacc gtgctctctg caccagtccc tgctgtgtg ctgtccagct cacctgtcta 1140
 ctgttttgtc cttgtgctct ccnccgtag 1169

<210> 102
 <211> 86
 <212> DNA
 <213> Homo sapiens

<400> 102
 ctactacatg ctggagaaca gaccgaggaa catctatggc atgggtctgct actcctgcct 60
 cctggcaccc cccaacacca aggaat 86

<210> 103

<211> 484
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)..(484)
 <223> n represents a, c, t, or g

<400> 103
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 cagaggggtgt aggaaagagc cggtcctggc acctggacaa ggtgaatcac agtaacagca 120
 ctagtgaag tgctcctgtg gcctgtccag gcaggtctat gaagggaggg gcgtttgcca 180
 catctgagcc ttgagtcaga ggctgaggtt ctagtgcagg ttggccacca gctacctgac 240
 aagtcactta acctccatga gcctcggttt tctcatcggg aatatggggg tgaagaaagn 300
 acaatanca tgactcttta gggttcatta aacagtctaa gaaatacaaa tatttagctc 360
 ccctcagcca tctctgcctc aggcccatc atgatcatga atccagatcc atgagctctg 420
 tggcagcgtg ctttgaaggt ggagcttctc tggatcattt gagggactct attttgcctt 480
 gcag 484

<210> 104
 <211> 87
 <212> DNA
 <213> Homo sapiens

<400> 104
 gtgtgggagc cacttcagga gcttctgcc aactccctgg cacctcgggc agcagcaccc 60
 tgtctccctt ccagcacgcc cacaag 87

<210> 105
 <211> 799
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)..(799)
 <223> n represents a, c, t, or g

<400> 105
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 gaagaggaga ggaaatgatc atgagtgatg attatggtgc gcttccccac ctggcctcac 120
 ctccctaatt taattgaatg acatgttgcc ccccgctgcag gaagtcatta tatctgcaat 180
 cagagttgat cctctatgg gtgtcctggg accgctggga ggtgctggtg gtgaaggcgg 240
 gggcatagcg gcaggtggac agcacaggca gctgcaagcc cggccaggag gagagaccag 300
 gcgtcctggg ctttggtttg gccgngagtt aacagcaatt ctatcactgg ttttcatata 360
 aacatgctga ccatagcact ttaatatata cttgcanaan gtncattttc attctncctt 420
 aaccagggaa gangggatcg nggaggaccc caangtttan tntgcctctc acanttagnc 480
 cccacntgg cttgncntna aggttgccaa agcagtagna gcgagaagca agctccctta 540
 ggaacaatna ggtancccca gaaaaagtct gganaggcca agtctgaggg cagcgagcag 600
 gggttgtggg cagtctggt ctggcagcca aaaccagcgc gnaggatttg gttctcagtc 660
 taagcaagca cctcagattt cagggttccc tgaaagcatc ccaggggcag ggccattgct 720
 tccagggggc ggagtcctgg agggaagacc agcaggatc ctgagctctg ggtcattcat 780
 gccttctctc caccacag 799

<210> 106
 <211> 126
 <212> DNA
 <213> Homo sapiens

 <400> 106
 aactctcagg ccaaggacac ctggccactg ccctgatcat tgcaatgtcc accatcttca 60
 tcatggccat cgccatcgtc ctcatcatca tgttctacat cctgaagaca aagccctctg 120
 cccag 126

 <210> 107
 <211> 96
 <212> DNA
 <213> Homo sapiens

 <400> 107
 gtgacggccc ccatgcgccg gtgccctgcc tccctggactc tccgtcaact cccctgtcg 60
 gagagcctgg ctgctcactc cctcctctct cccag 96

 <210> 108
 <211> 75
 <212> DNA
 <213> Homo sapiens

 <400> 108
 cctgttgac cagccacccg ggggaagagcg tggaggccca agtgagcaag gacgaggaga 60
 agaaagaggc cccag 75

 <210> 109
 <211> 243
 <212> DNA
 <213> Homo sapiens

 <220>
 <221> misc_feature
 <222> (1)..(243)
 <223> n represents a, c, t, or g

 <400> 109
 gtctgtgaac cagggcttcc acacaccatg tgcacggtgc ccattctctgg gtggagggcg 60
 ttcccagaag cagcctcctc gctgcttctg ctctcacatg ctgaaccata ctgtgcttac 120
 cgtgggggtgg tgccacacag acaccgggca gctctgcca acaggaagag caggggttggg 180
 ctgagcgcan agccatgagc caattctaac tcctatctcc ccaacctccc catttccctg 240
 cag 243

 <210> 110
 <211> 73
 <212> DNA
 <213> Homo sapiens

 <400> 110
 acaacgtggt gatgttctcc gagaaggatg aatttgagaa gctgacagca acttcagcaa 60

agccccaccaa gag

73

<210> 111
<211> 1174
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)..(1174)
<223> n represents a, c, t, or g

<400> 111
gtatgtggaa gccccacac caagctgaac tggggtcctg tggatcctga gcagggaggg 60
gttnccaggg tgcagccgag tgaactgaca ggctagcctg ggacactatg gggacgttcg 120
gcgacagaca gtccccacca cctctttgct gactggcagg ggtaggtgg tgtgaggagc 180
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gacaccagtt gaacttgggt gcttactggg attaaatata gagatctagg acatattcaa 840
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cccgtgccc caaggtgccc agtaaaccac tgaaaaacaa gtcattgccc cccactgtcc 1080
acagtggggc aatggacaag ttcaccacag gagaacttgt cagggctgca gccccccag 1140
gcactgctaa tgaccatcgc tctgttttt gcag 1174

<210> 112
<211> 160
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)..(160)
<223> n represents a, c, t, or g

<400> 112
cgagaacgat gcctcatcng agaattgagca gctgctgagc cggagcgtcg acagtgatga 60
ggagcccggc cctgacaagc agggctcccc ggagctgtgc ctgctgtcgc tggttcacct 120
ggccaggggag aagtctgcc caagcaacaa gtcagccggg 160

<210> 113
<211> 226
<212> DNA
<213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)..(226)
 <223> n represents a, c, t, or g

<400> 113
 gtgaggctcc tgcaggtgcc atgatgagct gtgagatgtg gctccctcac agccgcaagg 60
 actaaaactt tcttattgaa tcagctctcc tgcaagacgg ggtgtttctc ccagaagtcc 120
 aagataggag acctggacag tgacaagttc acagcaagat agtcaaaagg gaaaaaaacc 180
 ctttcgtttt tgagttttgt ttttttttn ggngatgana gnctng 226

<210> 114
 <211> 61
 <212> DNA
 <213> Homo sapiens

<400> 114
 attcaaagcc ggaggaaaaa gatcctcgat gtgtatgcca acgtgtgtgg agtcgtggaa 60
 g 61

<210> 115
 <211> 309
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)..(309)
 <223> n represents a, c, t, or g

<400> 115
 agagtggngg aagagngaag ggaggngaaa agggggngag ngagggaagg aggnnggaan 60
 nnggagttag ggggggaagg ggnagagngg gnggnagn gnngngagng gganagnaa 120
 agnagtgaga ngggaaggna nagngagnag gggnnangag aaagnngggag ngtagngggc 180
 gatngnnng gtngaaatat tnanagaaat tttttcaaat aatttttatt tcattttaa 240
 aatttttcag tgttgacctt ctattgactg tgacttgcaa catctaactg tggccattgg 300
 tgtctgtag 309

<210> 116
 <211> 2781
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)..(2781)
 <223> n represents a, c, t, or g

<400> 116
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 ccacgtacaa ctctgagaag gctgttgatg aaacgtggcg ccacctcgcc gagagcttcg 120
 gcctgaagag ggatgagatt gggggcatga cagacggcat gcaactcttt gaccgcatca 180
 gcacggcagg ctacagcatc cctgagctac tcacaaaact ggtgcagatt gagcggctgg 240
 atgctgtgga gtccttgtgt gcagacatac tggagtgggc gggggttgtg ccacctgcct 300

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cccagccaca tgctgcatcc tgaaaagcat gcctgtgggc tgtcctccca ggacaagcca 360
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cccagggtag gtctgtggcc cttanacagt gaaagtctta attggcaata ttatttttgc 2700
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aaaaaaaaa aaaaaaaaaa a

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2781

<210> 117

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
diagnosis ED.

<400> 117

aaaaagtaac actgaccta ttt

23

<210> 118
 <211> 19
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primers that can be used to
 diagnosis ED.

 <400> 118
 agaaagcagg acctcctgg

19

<210> 119
 <211> 24
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primer that can be used to amplify
 TNF homology domain of mouse dl.

 <400> 119
 ggattccagg aacaactggt atgg

24

<210> 120
 <211> 25
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primer that can be used to amplify
 TNF homology domain of mouse dl.

 <400> 120
 cctacacaca gcaagcacct tagag

25

<210> 121
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:
 Oligonucleotide primer that can be used to amplify
 TNF homology domain of mouse dl.

 <400> 121
 gtcgacgaaa atcagccagc tg

22

<210> 122
<211> 21
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
Oligonucleotide primer that can be used to amplify
TNF homology domain of mouse dl.

<400> 122
aagcttctag gatgcagggg c

21